Code Inspector's Handbook for understanding Electric Locking Hardware

Compliments of ASSA ABLOY, the global leader in door opening solutions



Table of Contents

Glossary of Common Electrified Locking Terms

Access Control

Any person, device, or system that qualifies a request for access. This can include recognition by others, possession of the correct key or card, knowledge of the correct code, or having the biological features to pass biometric review (facial recognition, retina scans, fingerprints, hand geometry, etc.) Failure to qualify typically results in not gaining **entry**.

Egress Control

Any person, device, or system that qualifies a request to exit. Such control is commonly used in institutional occupancies where elopement presents a danger to oneself or to others. Failure to qualify typically results in not being able to **exit**.

Free Egress

The ability to **exit** at will.

Free Ingress

The ability to **enter** at will.

Delayed Egress

A delay between the attempt to exit and the ability to exit. In door hardware systems, it is accomplished by the triggering of a switch within a component of the door hardware during the course of an exit attempt. The switch starts an irrevocable timing sequence, usually 15 seconds, leading to the unlocking of the door in the direction of egress.

Fail-Secure

A term used to describe an electric lock that has a mechanical state of being locked and requires power to unlock it. Also known as **electrically unlocked**.

Fail-Safe

A term used to describe an electric lock that has a mechanical state of being unlocked and requires power to lock it. Also known as **electrically locked**.

Lock Function

A term used to describe a selection from the classification system for the functional characteristics of locks. Four functions are commonly used with electrically controlled access systems:

Passage Function

Free egress and ingress. No locking controls are present from either side. Commonly used with electromagnetic locks to provide necessary latching for fire-labeled doors.

Classroom Function

Free egress. Exterior lever can be locked or unlocked using a key, resulting in a mechanical function change from **passage** to **storeroom**. Used, but not recommended for electric locking systems as it introduces the human error of forgetting to relock the door.

Storeroom Function

Free egress. Non-functioning exterior lever. Key retracts latch for entry. Available as an electrically controllable lock in both fail-secure and fail-safe. Application or removal of electric current temporarily changes function to **passage**.

Asylum Function, aka Institutional Function

Locked from both sides. Key required to retract latch from either side. Cannot be left unlocked from either side. Available as an electrically controllable lock in both fail-secure and fail-safe. Application or removal of electric current temporarily changes function to **passage**.

Switch Bar, aka Active Dummy with Switch

A panic style bar with no latching mechanism that is designed to switch a low voltage electrical current. Some are **UL Listed for the purpose of directly breaking power to an electromagnetic lock**.

Locking and Latching Mean Different Things

"A door can be latched, but not locked; locked, but not latched or locked and latched"

Positive Latching

A type of latching where the latch will not disengage the strike unless another mechanical event occurs, such as pushing on a panic bar or turning a lever or knob.

Latch, (n.) aka latch bolt.

The beveled, spring loaded component of a door hardware device that projects into or behind an obstruction (called a strike) to prevent the door from opening. *Ex.: The lock has a latch.*

Latch, (v.)

The action of the beveled, spring loaded device component as it drops into or behind the hole or obstruction. *Ex.: Did the door latch?*

Latched, (v.)

A condition where the beveled, spring loaded device component has projected into or behind the hole or obstruction *Ex.: Is the door latched?*

Latching, (n.)

The capability of the beveled, spring loaded device component *Ex.: Make sure that the locks are latching properly.*

Lock, (n.)

A device used to prevent passage through a door by restricting its movement from a closed position. *Ex.: Take the lock out of the box and install it.*

Lock, (v.)

The action of using a device to prevent passage through a door by restricting its movement from a closed position *Ex.: Will you lock the door?*

Locked, (v.)

A condition where the device has restricted the movement of the door from a closed position *Ex.: The door is locked.*

Locking, (adj.)

A description of the action of a device that restricts movement of a door from a closed position. *Ex.: Did you install a new locking system?*

Common Electrified Locking Solutions

Mortised Electric Strikes for Frame or Inactive Door

Installed in the frame or door as a replacement for the Flat Strike



Surface Mounted Electric Strike on Frame or Inactive Door

Installed for use with Rim Panic Bars



Unlatch For Mortise or Cylindrical Locks

Installed in the Frame without Modification



Cylindrical Lock

Mechanical or Electric



Mortise Lock

Mechanical or Electric



Rim Panic Bar

Mechanical or Electric



Mortise Panic Bar

Mechanical or Electric



Surface Vertical Rod Panic Bar

Mechanical or Electric – Top Rod or Top and Bottom Rod



Concealed Vertical Rod Panic Bar

Mechanical or Electric



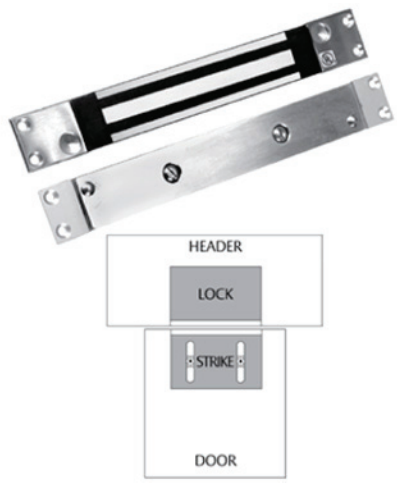
Solenoid Bolt Lock

Obsolete-Usually Located In Header
Released By Other Hardware



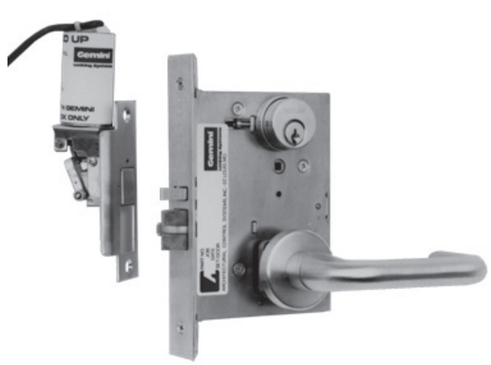
Shear Style Lock

Usually located in Header
Released By Other Hardware



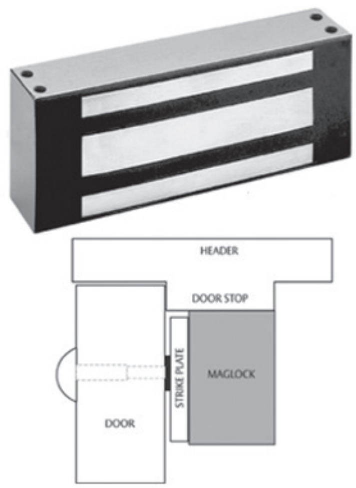
Frame Actuated Mechanical Device

Replaces Strike – Losing Popularity

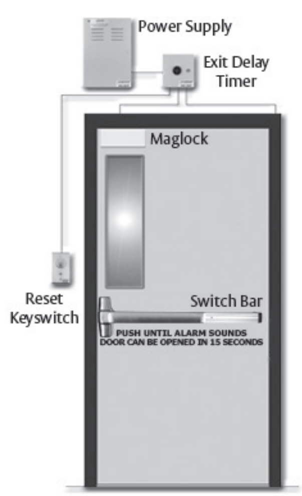


Electromagnetic Lock

Released By Other Hardware



Delayed Egress System Using Electromagnetic Lock



Initiation: Attempt To Egress

Delayed Egress System Using Dedicated Electromagnetic lock

Initiation: Door Movement



Delayed Egress System Using Dedicated Panic Hardware

Initiation: Attempt To Egress



The Electric Aluminum Door Latch

Released By Other Hardware



Electric Panic Bar Trim

Ingress Device - Does not affect Egress



Specific Roles of Electric Locking Components

Electric Strike

A Fail-Secure Electric Strike is a replacement for the flat strike plate used with cylindrical locks, mortise locks and mortise panic bars, or the surface mounted obstruction used to engage a rim panic bar latch. Locks used with electric strikes typically have their own method of mechanical release, either by turning a lever or pushing on a panic bar, making the door free-egress. These are the preferred strikes for security and can be fire-listed.

A Fail-Safe Electric Strike is a replacement for the flat strike plate used with cylindrical locks, mortise locks, and mortise panic bars, or the surface mounted obstruction used to engage a rim panic bar latch. Removing power causes the fail-safe electric strike to fail in a released position. This makes it excellent for use with asylum function cylindrical or mortise locks to control flight in a wing used to house patients with diminished mental capacity. It can also control locks reversed to protect an office suite located off of an elevator lobby. Typically, these electric strikes are wired to release on alarm from the fire system. The drawback to their use is that they cannot be fire listed as their release would prevent positive latching.

Electric Cylindrical or Mortise Lock

A Fail-Secure, Storeroom Function, Electric Cylindrical or Mortise Lock is a free egress door lock with a small solenoid inside that will change the function of the lock to passage when power is applied. It is also known as electrically unlocked. Latching is maintained and the lock is available as a fire-listed device.

A Fail-Safe, Storeroom Function, Electric Cylindrical or Mortise Lock is a free egress door lock with a small solenoid inside that will change the function of the lock to passage when power is removed. It is also known as electrically locked. Latching is maintained and the lock is available as a fire-listed device, making it an ideal choice for high-rise stair towers (IBC 403.5.3).

A Fail-Secure, Asylum Function, Electric Cylindrical or Mortise Lock is locked from both directions and power must be applied to (or a key used) to release it. It should only be used where a wall would normally be and never relied upon for exit. It can be fire-listed and would typically be used to divide tenant spaces.

A Fail-Safe, Asylum Function, Electric Cylindrical or Mortise Lock is locked from both directions and power must be removed (or a key used) to unlock it. This lock should be used where total control is necessary for the well-being of both those inside and outside. Typical usage would include control of flight risk patients in a facility housing patients with diminished mental capacity. These locks are usually wired to release upon alarm from the fire system. Latching is maintained and can be fire-listed.

Panic Bars

Electric latch retraction (or release) panic bars always allow free egress and allow ingress by electrically retracting or releasing the latch. They are available as fire-exit hardware.

Electric Trim, *Fail-Secure*, for Panic Bars controls ingress, only, and can be fire-listed. Free egress is provided by the panic bar and is not impeded by the electric trim. Door will remain locked from the outside when power is removed.

Electric Trim, *Fail-Safe*, for Panic Bars controls ingress, only, and can be fire-listed. Free egress is provided by the panic bar and is not impeded by the electric trim. Door will unlock from the outside when power is removed. This device is perfect for high-rise stair tower doors (IBC 403.5.3).

Other Electromechanical Devices

A Frame Actuated Mechanical Device is an electric control mounted in the strike position that changes the function of a mortise lock from storeroom to passage by pushing or releasing the lock's auxiliary latch. Originally invented to address the high-rise stair tower codes requiring free ingress, their popularity has decreased due to improvements to the fail-safe electric mortise lock.

Surface and Mortised Solenoid Bolt Locks were commonly used in the last half of the 20th century as an aesthetically pleasing method of locking the door from the top of the frame. Allowed under both BOCA and UBC, they have since become illegal to install or even replace in many areas. This is due to the binding against the bolt that can occur when attempting to exit prior to the bolt retracting.

A Shear Style Lock is a specially engineered, low power electromagnetic lock mounted with the shear line horizontally positioned. Both the lock face and the armature have mechanical interferences that cause them to interlock when powered. Some models can bind if released using bars with switches.

An Electric Aluminum Door Latch is an electric version of the standard latch used in storefront doors for decades. The latch can be released by a lever/paddle handle or by applying voltage. A mortise cylinder is installed on the outside to provide key entry.

Electromagnetic Lock

An Electromagnetic Lock is a surface mounted lock with no moving parts. It is always fail-safe and has no interlocking mechanisms. It cannot bind or lock when power is removed. It requires additional devices to release it by removing power to it. Additional devices include panic bars with switches, non-latching bars with switches, and button/timer/motion detector combinations, depending on the code used, the year, and local supplements.

2009 Comparison of "Access Controlled Egress Doors"

IBC 1008.1.4.4 Access-controlled egress doors. The entrance doors in a *means of egress* in buildings with an occupancy in Group A, B, E, I-2, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in Groups A, B, E, I-2, R-1 or R-2 are permitted to be equipped with an **approved** entrance and egress access control system which shall be installed in accordance with all of the following criteria:

1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to that part of the access control system which unlocks the doors shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016mm to 1219mm) vertically above the floor and within 5 feet (1524mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the lock—independent of the access control system electronics—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.
6. Entrance doors in buildings with an occupancy in Group A, B, E or M shall not be secured from the egress side during periods that the building is open to the general public.

NFPA 7.2.1.6.2 Access-Controlled Egress Door Assemblies. Where permitted in Chapters 11 through 43, door assemblies in the means of egress shall be permitted to be equipped with an approved entrance and egress access control system, provided that all the following criteria are met:

1. A sensor shall be provided on the egress side, arranged to detect an occupant approaching door leaves that are arranged to unlock in the direction of egress upon detection of an approaching occupant or loss of power to the sensor.
2. Loss of power to the part of the access control system that unlocks the door leaves shall automatically unlock the door leaves in the direction of egress.
3. Door leaves shall be arranged to unlock in the direction of egress from a manual release device located 40in. to 48in. (1015mm to 1220mm) vertically above the floor and within 60 in. (1525mm) of the secured door openings.
4. The manual release device specified in 7.2.1.6.2 (3) shall be readily accessible and clearly identified by a sign that reads as follows: PUSH TO EXIT.
5. When operated, the manual release device shall result in direct interruption of power to the lock-independent of the access control system electronics-and the door leaves shall remain unlocked for not less than 30 seconds.
6. Activation of the building fire-protective signaling system, if provided, shall automatically unlock the door leaves in the direction of egress, and they shall remain unlocked until the fire-protective signaling system has been manually reset.
7. The activation of manual fire alarm boxes that activate the building fire-protective signaling system specified in 7.2.1.6.2 (6) shall not be required to unlock the door leaves.
8. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the door leaves in the direction of egress, and they shall remain unlocked until the fire-protective signaling system has been manually reset.

2009 Positions of the Model Codes Regarding Electromagnetically Locked Egress Doors Being Released By a Switch built Into the Hardware

IBC 1008.1.8.7 Electromagnetically locked egress doors. Doors in the means of egress that are not otherwise required to have panic hardware in buildings with an occupancy in Group A, B, E, M, R-1, or R-2 and doors to tenant spaces in Group A, B, E, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch and meet the requirements below:

1. The listed hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.
3. Operation of the listed hardware releases the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the listed hardware automatically unlocks the door.

NFPA 7.2.1.5.5 Electrically Controlled Egress Door Assemblies. Door assemblies in the means of egress shall be permitted to be electrically locked if equipped with approved, listed hardware that incorporates a built-in switch, provided that the following conditions are met:

1. The hardware for occupant release of the lock is affixed to the door leaf.
2. The hardware has an obvious method of operation that is readily operated in the direction of egress.
3. The hardware is capable of being operated with one hand in the direction of egress.
4. Operation of the hardware interrupts the power supply directly to the electric lock and unlocks the door assembly in the direction of egress.
5. Loss of power to the hardware automatically unlocks the door assembly in the direction of egress.

The primary difference between these two codes is the IBC limitation regarding doors that require panic hardware (egress of 50+ people). Expansion of this limitation to include panic hardware, as does NFPA, begins with the 2012 IBC, as follows:

2012 IBC/IFC

IBC1008.1.9.8 (IFC [B] 1008.1.9.8 Electromagnetically locked egress doors. Doors in the means of egress in buildings with an occupancy in Group A, B, E, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch and meet the requirements below:

1. The listed hardware that is affixed to the door has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.
3. Operation of the listed hardware directly interrupts the power to the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the listed hardware automatically unlocks the door.
5. Where panic or fire exit hardware is required by section 1008.1.10, operation of the listed panic or fire exit hardware also releases the electromagnetic lock.

2009 Positions of the Model Codes on Delayed Egress

NFPA

NFPA 7.2.1.6.1 Delayed-Egress Locking Systems. Approved, listed, delayed egress locking systems shall be permitted to be installed on door assemblies serving low and ordinary hazard contents in buildings protected throughout by an approved, supervised automatic fire detection system in accordance with Section 9.6 or an approved, supervised automatic sprinkler system in accordance with Section 9.7, and where permitted in Chapters 11 through 43, provided that the following criteria are met:

1. The provisions of 7.2.1.6.2 for access-controlled egress door assemblies shall not apply to door assemblies with delayed-egress locking systems.
2. The door leaves shall unlock upon actuation of one of the following:
   (a) Approved, supervised automatic sprinkler system in accordance with Section 9.7
   (b)Not more than one heat detector of an approved, supervised automatic fire detection system in accordance with Section 9.6
   (c)Not more than two smoke detectors of an approved, supervised automatic fire detection system in accordance with Section 9.6
3. The door leaves shall unlock upon loss of power controlling the lock or locking mechanism.
4. An irreversible process shall release the lock within 15 seconds, or 30 seconds where approved by the authority having jurisdiction, upon application of a force to the release device required in 7.2.1.5.9 under the following conditions:
   (a)The force shall not be required to exceed 15lbf (67N).
   (b)The force shall not be required to be continuously applied for more than 3 seconds.
   (c)The initiation of the release process shall activate an audible signal in the vicinity of the door opening.
   (d)Once the lock has been released by the application of force to the releasing device, relocking shall be by manual means only.

A readily visible, durable sign in letters not less than 1 in. (25mm) high and not less than 1/8 in. (3.2mm)in stroke width on a contrasting background that reads as follows shall be located on the door leaf adjacent to the release device:

IBC 1008.1.9.7 Delayed egress locks. Approved, listed, delayed egress locks shall be permitted to be installed on doors serving any occupancy except Group A, E, and H occupancies in buildings that are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center.
4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for 1 second to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only.
   Exception: Where approved, a delay of not more than 30 seconds is permitted.
5. A sign shall be provided on the door located above and within 12 inches (305mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 (30) SECONDS.
6. Emergency lighting shall be provided at the door.

T**wo new codes were added** by the CTC (Code Technical Committee) that affect institutional detention. One is similar to 1008.1.9.7 Delayed egress locks, but is designed for the restraint of mentally impaired patients in an I-2 facility. The other is for correctional facilities.

IBC 1008.1.9.6 Special locking arrangements in Group I-2. *Approved* delayed egress locks shall be permitted in a Group I-2 occupancy where the clinical needs of persons receiving care require such locking. Delayed egress locks shall be permitted in such occupancies where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or an *approved* automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an *exit*.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center, a nursing station or other approved location.
4. The procedures for the operation(s) of the unlocking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the International Fire Code.
5. All clinical staff shall have keys, codes or other means necessary to operate the locking devices.
6. Emergency lighting shall be provided at the door.

Exception: Items 1 through 3 shall not apply to doors to areas where persons, because of clinical needs, require restraint or containment as part of the function of a mental hospital.

IBC 1008.1.9.9 Locking arrangements in correctional facilities. In occupancies in Groups A-2, A-3, A-4, B, E, F, I-2, I-3, M and S within correctional and detention facilities, doors in *means of egress* serving rooms or spaces occupied by persons whose movements are controlled for security reasons shall be permitted to be locked when equipped with egress control devices which shall unlock manually and by at least one of the following means:

1. Activation of an *automatic sprinkler system* installed in accordance with Section 903.3.1.1;
2. Activation of an *approved* manual alarm box; or
3. A signal from a constantly attended location.

<u>The History of the Conflict Between Codes and Electromagnetic Locks</u>

By Edward A. Hite, CML, CFDI

Over 30 years ago, electromagnetic locks were developed and thrust into a hardware market familiar with the concept that latches and bolts locked doors, not invisible rays. Most people understood what magnets were, but their strength truly was futuristic. *The combination of "new" and "futuristic" was the start of a problem that would last for decades.*

Electromagnetic locks were introduced when electric bolt locks were popular on glass and aluminum doors but *didn't bind like electric bolts. They represented an improvement to life safety.* Like electric bolts, they were typically released using buttons, but button locations could be obscure and people either couldn't find them or didn't know to push them. Buttons required "special knowledge" and eventually became prohibited by every model code. Soon, motion detectors, commonly used in alarm systems, began appearing as a way to release the lock. Though they failed "open" (fail safe) in a power loss, they were subject to electronic failure and were deemed unreliable and not accepted as a primary device for the release of a lock.

During this same time period, switches became popular in panic bars to signal the access control system of the difference between a "legal" exit and a break-in. Most panic bar manufacturers didn't offer a retrofit switch kit and *retrofit switches became available* from a variety of after-market sources. Soon, they were used for breaking power to electromagnetic locks. ***Some*** installers interrupted the power directly. Unfortunately, others allowed the signal to be processed at the CPU before interrupting the lock power. This created an unacceptable delay between the effort to egress and the ability to egress. ***It also made egress dependent upon the access control system working properly.*** In early days, there were many incidents of people being trapped in buildings due to CPU failures. These incidents caused code officials to react quickly by striking at the visible components. *The common denominator was the electromagnetic lock.* Although electromagnetic locks were not the problem, without them the problem went away.

In the Washington, D.C. area during the 1980s and 1990s, defense contractors like TRW routinely specified all-glass doors. *Security contractors could not find a way to attach a bar with a switch onto a glass door*, nor run wire to it. Pairs of door also presented a problem, as bars could be depressed from the outside using a wire pushed through the gap. As a result, *the contractors proposed an* ***alternate method*** *to the three primary building and fire code organizations* (UBC/UFC, the Southern Building Code, and BOCA) to allow a passive infrared motion detector <u>combined</u> with a button to release the electromagnetic lock. To approve this alternate, they had to agree to several provisions including: a 30 second, re-triggerable timer built into the button; installation of the button within 5 feet of the door; the lock power interrupted directly and independently of the access control system; and lock power "dropped" when the fire system is in alarm. This ***alternate method*** was entered into the three codes at the subsequent revisions, *placed under "Special Locking Arrangements"* and titled ***"Access Controlled Egress Doors."***

Another new code, ***"Delayed Egress Locks,"*** offered an early answer to dementia facility patient containment. Some integrators and manufacturers saw other uses for delayed egress. Department stores and restaurants used them on designated, but unused exits to control walk-outs and pilfering. Some companies used delayed egress to give the security guard 15 or 30 seconds to respond to those who did not use their access cards for egress, since it was illegal to lock people inside a building. Code provisions for delayed egress included either a 15 or 30 second delay time and the system had to unlock when the fire system was in alarm. The new code was called ***"Delayed Egress Locks"*** and was *placed under "Special Locking Arrangements."*

T*he two codes, "Access Controlled Egress Doors" and "Delayed Egress Locks" still are commonly mixed and confused.* The two most commonly confused points are: 1) the 30 second delay to relock in "Access Controlled Egress Doors" vs the 30 second delay to unlock allowable under AHJ special circumstances in "Delayed Egress Locks" and 2) the perceived requirement for buttons or PIRs in "Delayed Egress Locks", which are not required and which would defeat the purpose of delayed egress.

Although Code Books can be detailed, less than one page is devoted to egress through an electromagnetically locked door and can be ambiguous. Egress codes are usually viewed through a fireman's eyes, yet other dangers must be considered. Few jurisdictions have the money or time to formally educate their code staff on every topic; egress codes are largely taught in the field. Many jurisdictions rely on their plans review departments to evaluate the plans for new or remodeled buildings. Those reviewing the plans are often protection engineers without field experience. They tend to hold to strict interpretations of the code wording.

The IBC states any of their codes can be explained by their committees, and both formal and informal interpretations are available. Unfortunately, formal interpretations can take months and are the opinions of the members of the Means of Egress Committee, based on their understanding of the problem and of the related code. Like copies and rumors, the last one is never the best or most accurate. Questions submitted to IBC must be answerable by a simple "yes or no" and must be based on language and definitions already found in the code. The process can be frustrating, evasive, and often nonproductive. No interaction between the committee and the submitter is provided for by the process. ***Within the Means of Egress section, the process has resulted in their handbooks clearly confusing "Delayed Egress Locks" with "Access Controlled Egress Doors."***

Today, confusion continues over "Access Controlled Egress Doors". The code is often incorrectly applied to doors with some type of electronic access control, and are automatically assumed to be under this code. The wording of the code **intended** to refer to the control of <u>access to egress</u> and, therefore, only with the locking of the inside of the door. Even today, many jurisdictions require that an electric strike, electric lock or panic bar be released by a PIR and that a button/timer be present, even though you need only turn the handle or push a bar to get out! *This code section was established as an **alternate method*** to the switch in the bar for use with all-glass doors, and for any pair of doors that might have too large a gap. As code people retired and new ones joined the teams, the common interpretation changed because a bar with a switch, accepted to meet the intent of the code, was not written into the codes. In 2000, the three code organizations merged to form the International Code Council and the three model codes were expanded and harmonized to become one. ***Unfortunately, the new building code didn't integrate this code as an <u>alternate</u> method during its formation and, therefore, the IBC did not permit switched bars of any type to be used for the release of electromagnetically locked doors until the 2007 Supplement.***

Under 2006 IBC, all electromagnetically locked egress doors must release upon fire alarm. However, terrorists could send a person into a facility, pull the fire alarm, and allow entry through other doors. Since the PIR requirement results in the door unlocking for both traffic near the inside of the door or the answering of the door, one cannot rely on the door for personal safety as user control has been removed. Misunderstandings, fear of change, and a lack of curiosity has taken the safest lock possible (nothing to jam, releases on loss of power) and rendered it ineffective in much of the security world.

Today, concerns about switches in bars, tested and listed for that purpose, are no longer justified. Switch and relay technology has advanced to reliably allow breakthroughs in aviation, medicine, and defense; this technology can certainly unlock a door!

Beginning with the IBC 2007 Supplement, electromagnetic locks can be installed on doors not requiring panic hardware and released by switches in hardware specifically tested and listed for that purpose. ***The 2012 IBC will allow control of electromagnetic locks with proven and listed switches in panic and fire exit hardware as long as the use of the bar directly interrupts power supplying the electromagnetic lock. There will be no requirement for fire system connection, and no other releasing devices are required.*** *Control of the door is returned to the user and safety and security are possible using electromagnetic locks.*

Electrified Hardware Summary Chart

MECHANICAL HARDWARE	ELECTRIC HARDWARE	FS	FSE	EGRESS	COMMENTS
Rim Panic Bar	Electric strike	No	Yes	Free	
Rim Panic Bar	Electric strike	Yes	No	Free	
Storeroom Mortise or Cylindrical	Electric strike	No	Yes	Free	
Storeroom Mortise or Cylindrical	Electric strike	Yes	No	Free	
Asylum Mortise or Cylindrical	Electric strike	No	Yes	Controlled	Addressed in IBC 2009
Asylum Mortise or Cylindrical	Electric strike	Yes	No	Controlled	Addressed in IBC 2009
Storeroom Mortise or Cylindrical	Securitron Unlatch	No	Yes	Free	
Storeroom Mortise or Cylindrical	Securitron Unlatch	No	Yes	Controlled	Addressed in IBC 2009
None	Storeroom Electric mortise or Cylindrical Lock	No	Yes	Free	
None	Storeroom Electric mortise or Cylindrical Lock	Yes	No	Free	
None	Asylum Electric mortise or Cylindrical Lock	No	Yes	Controlled	Addressed in IBC 2009
None	Asylum Electric mortise or Cylindrical Lock	Yes	No	Controlled	Addressed in IBC 2009
Locking Trim for Panic Bar	Electric Latch Retraction or Release Panic Bar	No	Yes	Free	
Panic Bar	Electric Exterior Trim	No	Yes	Free	
Panic Bar	Electric Exterior Trim	Yes	No	Free	
Passage Trim for Panic Hardware	Panic Hardware with Switch and Electromagnetic Lock	Yes	No	Free	
Pull Hardware	Switch Bar and Electromagnetic Lock	Yes	No	Free	
Storeroom Function Hardware	Button, Timer, Motion Detector and Electromagnetic Lock	Yes	No	Free	Requires key for ingress
Passage Function Hardware	Button, Timer, Motion Detector and Electromagnetic Lock	Yes	No	Free	Takes user control away - security risk
Pull Hardware	Button, Timer, Motion Detector and Electromagnetic Lock	Yes	No	Free	Takes user control away - security risk
Pull Hardware	Electric Aluminum Door Latch with Paddle Handle	No	Yes	Free	
Locking Trim for Panic Bar	Integrated Delayed Egress Panic Bar	Yes	No	Delayed	May require key for ingress. Some brands leave trim unlocked-security risk
Locking Trim for Panic Bar	Integrated Delayed Egress Panic Bar with FSE Electric Strike	Yes	No	Delayed	Some brands leave trim unlocked - security risk
None	Integrated Delayed Egress Panic Bar with Electric Trim	Yes	No	Delayed	Security risk - unlocked until reset
None	Integrated Delayed Egress Panic Bar with Electric Trim	No	Yes	Delayed	Fail Secure electric trim available in some brands
Passage Trim for Panic Hardware	Panic Bar w/Switch, Electromagnetic Lock, Delay System	Yes	No	Delayed	Security risk - unlocked until reset
Locking or No Trim for Panic Hardware	Panic Bar w/Switch, Electromagnetic Lock, Delay System	Yes	No	Delayed	Requires key for ingress
Pull Hardware	Switch Bar, Electromagnetic Lock, Delay System	Yes	No	Delayed	Security risk - unlocked until reset
Storeroom Function Hardware	Integrated Delayed Egress Electromagnetic Lock	Yes	No	Delayed	Requires key for ingress
Passage Function Hardware	Integrated Delayed Egress Electromagnetic Lock	Yes	No	Delayed	Security risk - unlocked until reset
None	Integrated Delayed Egress Electromagnetic Lock	Yes	No	Delayed	Security risk - unlocked until reset
Pull Hardware	Integrated Delayed Egress Electromagnetic Lock	Yes	No	Delayed	Security risk - unlocked until reset

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ASSA ABLOY is the global leader in door opening solutions,
dedicated to satisfying end-user needs for security, safety and convenience

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